

# MOVING TOWARDS A **RABIES-FREE** SOUTHEAST ASIA







# EXECUTIVE SUMMARY

Rabies is a neglected tropical disease that is virtually 100 per cent fatal once symptoms emerge<sup>1</sup>. The disease causes an estimated 59,000 human deaths annually in more than 150 countries, with 95 per cent of cases recorded in Africa and Asia<sup>2</sup>. The disease has spread to areas where it has not previously been considered a major healthcare issue in Vietnam<sup>3</sup>, and to places where it has not previously been reported in Indonesia, according to data from the country's Ministry of Agriculture. The Covid-19 pandemic and other emerging disease threats have also diverted resources from tackling rabies in Southeast Asia<sup>4</sup>.

While the region's large population of free-roaming, unvaccinated dogs is a major vector, a lack of awareness of the risks of rabies and how to respond to outbreaks have also contributed to transmission. This white paper explores strategies to achieve the 'Zero by 30' global strategic goal to end dog-mediated human rabies by 2030, in Southeast Asia. Solutions include regional cooperation to vaccinate dogs, improve education – particularly among children – and heighten surveillance in vulnerable areas.

## Disclaimer:

The information published in this white paper was gathered through first-hand interviews and secondary research.

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# Rabies continues to spread in post-pandemic Southeast Asia

- Spread of rabies has been escalating in Southeast Asia since 2020, in some areas where cases have not previously been recorded;
- Resource diversion from Covid-19 and competing diseases, paused dog vaccination campaigns, low awareness in vulnerable areas, cross-border transmission and dog meat trade are cited among causes;
- Solutions include regional cooperation, with localized implementation of mass dog vaccination, human and animal surveillance, education and awareness programs, experts say.

While rabies has been eliminated in developed countries in Asia Pacific, more than 600 million people are at potential risk of rabies exposure in Southeast Asia. Dog-mediated rabies is endemic in most of Southeast Asia; 8 of the 10 countries across the Association of Southeast Asian Nations (ASEAN) member states<sup>5</sup>.

Large populations of free-roaming dogs, low vaccination rates among pets and strays, and the dog and cat meat trade are among the cited reasons why Southeast Asia is a rabies hotspot.

## Covid-19's impact on rabies control

The global spread of the SARS-CoV-2 virus has swamped the resources needed to control rabies. Mass vaccination programs to immunize free-roaming dogs – by far the dominant spreader of the disease, which is typically transmitted in the saliva of a dog bite – have been rolled back due to budget cuts and Covid-19 movement restrictions, and rabies vaccines have become scarcer, particularly in resource-constrained, remote parts of the region that are most vulnerable to infection.

In Indonesia, rabies cases have almost doubled since the pandemic. The spike in rabies cases and the coronavirus are “inseparably” linked, says Dr Nuryani Zainuddin, director general of Livestock and Animal Health Services at Indonesia’s Ministry of Agriculture, whose country’s population of 15 million dogs<sup>6</sup> are mostly free-roaming and unvaccinated, posing an ongoing risk of dog-mediated human rabies cases.

Misinformation and conspiracy theories surrounding Covid-19 vaccines may have diminished confidence in vaccinations more generally, and discouraged people from immunizing themselves and their dogs against rabies, suggests Dr Terence Scott, director of programs for the Global Alliance for Rabies Control (GARC), a global non-profit that works to eliminate the disease. “On the positive side, people understand the logistics and scale needed to vaccinate a significant portion of the population – and the concept of herd immunity,” he says.

meat trade, which is believed to have recovered post-pandemic.

Spikes in rabies cases have been reported this year in Vietnam, Indonesia, the Philippines, Thailand, and even Malaysia, which was declared rabies-free in 2013, only to lose that status two years later after repeated outbreaks<sup>7</sup>.

## A neglected disease

Despite the recent increases in cases of the deadly disease, awareness of rabies risk is low. In Singapore, which has been rabies-free since the 1950s, sustainability professionals Eco-Business questioned were not aware that the disease has escalated in neighboring countries post-pandemic.

Awareness of what rabies is, how it is transmitted and how people should respond to exposures is also low in the most susceptible areas to the disease, where there are many free-roaming, unvaccinated dogs. Folk medicinal practices, such as applying garlic, leaves or coins to bite wounds, or a traditional healer sucking and spitting out the blood from an infected wound, are still used to attempt to treat rabies in some high-risk parts of Indonesia and the Philippines. Wahid Fakhri Husein, an infectious disease specialist based in Indonesia, told Eco-Business of the mystic belief among rural communities in parts of Sumatra and East Nusa Tenggara that eating the brain of a rabid dog that has just bitten a person is effective protection against the disease.

This is not only untrue, but incredibly dangerous, putting people that may not have been exposed at extremely high risk of exposure.

**Rabies is a transboundary problem.**

**Gyanendra Gongal,**  
senior public health official,  
Southeast Asia office,  
World Health Organization

The easing of Covid-19 movement restrictions may also have facilitated rabies transmission across the region. “Rabies is a transboundary problem,” says Gyanendra Gongal, a senior public health official at the Southeast Asia office of the World Health Organization (WHO). He points to the spread of rabies from Indonesia to Malaysia on the island of Borneo by free-roaming dogs, between islands within Indonesia and the Philippines via dogs on fishing boats, and into Vietnam from neighboring countries for the dog

Low awareness of the disease presents another problem: underreporting or misreporting of cases, which leads some experts to suspect that the prevalence of rabies in Southeast Asia may be considerably higher than official figures suggest. “Poor data is a sign of a neglected disease,” says Dr Alicja Izydorczyk, international director of animal welfare at the Soi Dog Foundation, an animal welfare charity based in Thailand.

**Poor data is a sign of a neglected disease.**

**Dr Alicja Izydorczyk,**  
international director of animal welfare, Soi Dog Foundation

Some cases are going unreported by local governments in Indonesia, because officials do not want their province to earn a reputation as a “problem area” for contagion, Fakhri told Eco-Business.

Cases are likely going unreported in the most vulnerable group to rabies transmission: children, who are the most likely to encounter rabid, free-roaming animals while playing outdoors – and account for almost half of all human rabies deaths globally. “Children often don’t want to tell their parents that they were bitten by a cat or dog,” says Dr Jerick De Villa of San Lazaro Hospital in the Philippines. For this reason, targeted rabies public information campaigns need to include schools with messaging on how to behave around potentially infected animals and respond to a bite from a rabid animal.

There are multiple reasons why bite victims are not seeking treatment. While one key reason is a lack of awareness as to what should be done when potentially exposed, some cannot afford to travel from rural areas in Vietnam or far-flung islands in the Philippines or Indonesia

to get to a bite center or hospital for medical consultation. In many cases, the bite victims cannot afford a vaccine, which is expensive for low-income families and must be administered in multiple doses.

## **The economic cost of rabies**

A key factor in eliminating rabies is economic, says Dr Izydorczyk of the Soi Dog Foundation. “There is no obvious economic payback from tackling rabies. Unlike livestock, which is a business worth billions of dollars, with free-roaming dogs – the main carrier of the disease – you do not gain monetarily from eliminating the disease. You will only be spending money,” she says.

Since rabies mainly affects marginalized communities and has little impact on international trade, rabies is not considered to be a disease of economic importance. However, rabies does come with an economic cost.

According to the study *Review on Economic Importance of Rabies in Developing Countries and Its Controls*, rabies transmitted by dogs – the source of 99 per cent of cases worldwide – is responsible for the loss of over 1.8 million disability-adjusted life years every year<sup>8</sup>, with direct and indirect economic costs including post-exposure prophylaxis (PEP) – the treatment given to patients bitten by a rabid animal – animal testing, dog capture and vaccination, and livestock losses totalling USD5.5 billion a year. The cost of PEP is highest in Asia, estimated at up to USD1.5 billion a year<sup>9</sup>.

**Children often don’t want to tell their parents that they were bitten by a cat or dog.**

**Dr Jerick De Villa,**  
medical consultant, infectious diseases and tropical medicine, San Lazaro Hospital

## MOVING TOWARDS A RABIES-FREE SOUTHEAST ASIA

A key motivation to eliminate the disease is that it is 100 per cent preventable, says Scott of GARC. “There is absolutely no need for anyone to die from it. We have the tools to eliminate rabies,” he says. A broadly accepted strategy for rabies control, according to the Centers for Disease Control and Prevention<sup>40</sup>, United States-based public health organization, includes:

- Strategic vaccination of dogs to a level that achieves herd immunity, at least 70 per cent of the dog population in a single mass vaccination exercise
- Education on rabies risk for the most vulnerable communities
- Ongoing surveillance to identify the most at-risk dogs and people
- Improving access to adequate medical care for bite victims

An understanding of the concept of “One Health”, which recognises the interplay between humans, animals and their shared environment, is critical for successfully deploying rabies control programs – as it is for preventing other zoonotic diseases, such as Covid-19.



**There is absolutely no need for anyone to die from it. We have the tools to eliminate rabies.**

**Dr Terence Scott,**  
director of programs,  
Global Alliance for Rabies Control

### Reality bites: Why controlling rabies is difficult

Deploying effective rabies control measures faces numerous obstacles in Southeast Asia, where diverse socio-economic realities, cultures and attitudes towards dogs make region-wide programs that adopt the same approach problematic. Besides low awareness of the disease and the use of ineffective traditional remedies in some rural areas, millions of free-roaming dogs in Southeast Asia need to be caught and vaccinated.

“Have you seen stray cats or dogs line up to get themselves vaccinated?” says Sharon Bengzon-Yap, education and campaigns officer at the Philippine Animal Welfare Society (PAWS), a 69-year old animal welfare charity that advocates for sterilization as well as vaccination to control at-risk dog populations. There are an estimated 12 million free-roaming cats and

dogs in the Philippines alone, many abandoned, unvaccinated pets. These animals “breed faster than they’re caught, vaccinated and sterilized,” says Bengzon-Yap.

The distance to adequately resourced health clinics is another challenge. “Rabies disproportionately affects vulnerable, disadvantaged areas that have poor access to vaccines,” says Chari Amparo, public health research officer for GARC, who is based in the Philippines. “According to several surveys, transportation costs are a key barrier for people affected by rabies.

For some people [living in remote areas], a roundtrip to a hospital costs more than a day’s wage. In tragic cases, parents must choose which of their family members they vaccinate, because they cannot afford to vaccinate them all.”





# Eliminating rabies: Three pieces of the puzzle

Eliminating rabies in Southeast Asia will require a tailored approach adapted to the local cultural context. There are broadly three factors at play in effective rabies control strategies, according to Boehringer Ingelheim, which advocates for community-led solutions that enable lasting protection for at-risk areas.

## VACCINATION



Providing high quality vaccines and sharing best practices are essential for resource-constrained local health authorities around Southeast Asia, as are the logistical constraints of transporting the vaccine to far-flung parts of the archipelago and a lack of technical knowledge to administer the vaccine. Public-private partnerships, such as the STOP Rabies program, can address the resource and skills gap in remote areas. In Puerto Galera, on the Philippines island of Mindoro, Boehringer Ingelheim supports the Bureau of Animal Industry and the local government with a mass vaccination, animal sterilization and responsible pet ownership program.

## EDUCATION



Building greater awareness and delivering education in communities directly impacted by rabies, especially among children, is key. In 2023, key local authorities, a group of university students and employees from Boehringer Ingelheim led festival-style events to raise awareness and engagement with rabies elimination efforts in Duc Hue district in the Long An province of Vietnam. The Soi Dog Foundation runs an educational program to teach school children in Thailand about humane treatment of animals and responsible pet ownership since 2017. Soi Dog hopes that the program will be integrated into the schools curriculum in Thailand.

## SURVEILLANCE



Stricter regulations on cross-border animal movements, vaccination certificates, and a shift in responsibility for rabies control to local jurisdictions is needed to better monitor the prevalence of rabies and identify at-risk animals and communities. The Global Alliance for Rabies Control's Vaccination and Sterilization Tracker (VST) tool enables users to track sterilization (spay/neuter) and rabies vaccination initiatives to monitor their progress and impact in real-time.

A major challenge to rabies elimination efforts in Southeast Asia is the dog and cat meat trade. An estimated five million dogs are slaughtered in Vietnam alone<sup>11</sup> for their meat, and the manner in which they are caught, transported – often across provincial or national borders, in grim conditions – and slaughtered poses a chronic problem for rabies transmission.

Stressed, injured or sick animals, which are typically deprived of food or water before they are slaughtered, are more likely to transmit diseases, and dog catchers and butchers are rarely vaccinated against rabies. “Some dog butchers work in animal control. The strays they catch are allegedly sold for their meat, even though the consumption of dog meat is illegal in the Philippines,” says Bengzon-Yap of PAWS.

Harmonization of animal and human health sectors is crucial to rabies prevention and control activities in the region. “While rabies does affect people, animal populations need to be targeted first [with vaccination efforts],” he says.

In countries such as the Philippines, rabies control is to be decentralized to give local governments more power to

run their own programs to confront the disease. This strategy could backfire if insufficiently resourced.

“Local governments lack the funding to tackle more common diseases such as hypertension, diabetes, and tuberculosis, let alone an already neglected one [like rabies],” argues Dr De Villa.

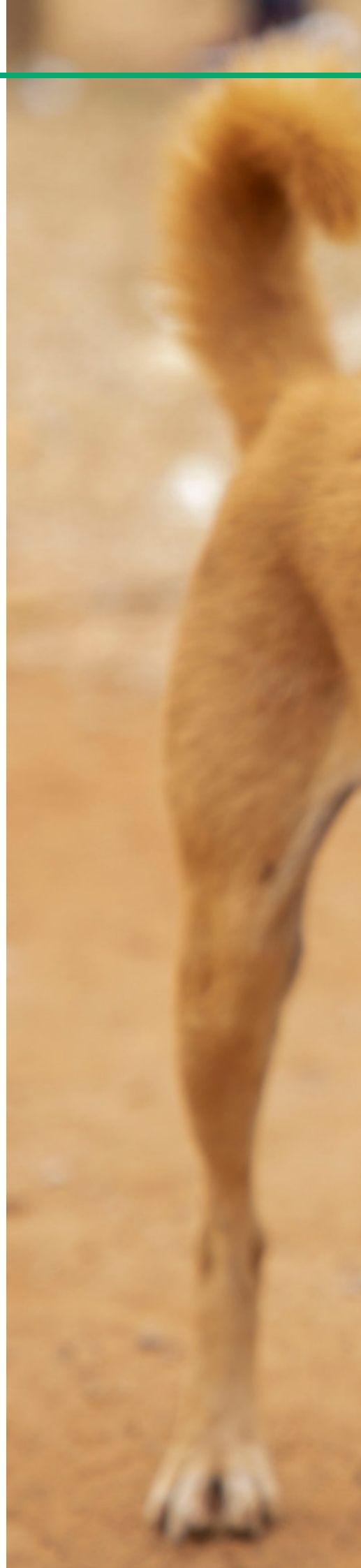
But local actors must play the lead role in rabies control programs, says Scott. “For a rabies control program to be sustainable, local governments have to take ownership of the strategy. International NGOs cannot be solely relied upon. Without government ownership, when they leave, the program collapses, and you go right back to where you started – or worse.”

In this white paper, Eco-Business explores the rabies landscape in Vietnam, Indonesia, the Philippines, Malaysia and Thailand, identifies where the gaps in controlling the disease lie in each country, and considers how to achieve the joint goal of the WHO, World Organisation for Animal Health (WOAH), Food and Agriculture Organization of the United Nations (FAO) and GARC, for zero human deaths<sup>12</sup> from dog-mediated rabies by 2030.

**“This rise in rabies cases across Southeast Asia calls for regional attention and local action to manage this preventable disease through dog vaccination, education and surveillance solutions. Only when communities are engaged in the mission can we unite to improve health for humans and animals.”**

**Dr Armin Wiesler,**

country managing director and head of animal health,  
regional operating unit ASEAN, Korea, Australia & New Zealand,  
Boehringer Ingelheim





## VIETNAM:

### Low vaccination rate and dog smuggling is aiding transmission

An average of 76 people have died from rabies in Vietnam each year between 2017 and 2021<sup>13</sup>, a 15 per cent decline compared to the prior four-year period.

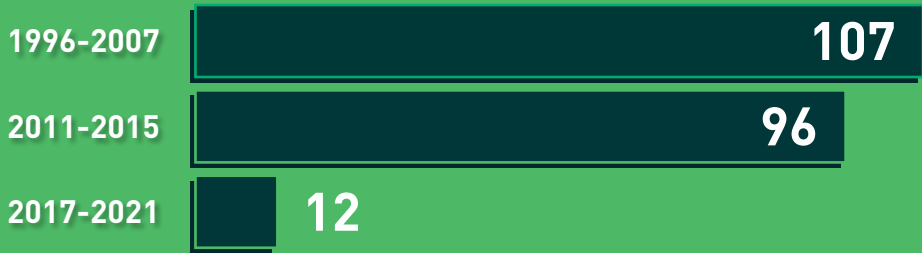
But from 2021-2023, some provinces where rabies has not previously been considered a hotspot are reporting new cases. For instance, in the southern province of Ben Tre, 12 human deaths from rabies were reported in 2022 – double the number recorded over

the previous year. Vietnam’s national rabies control efforts, which have included managing and vaccinating the free-roaming dog population and appointing village leaders in remote areas to manage and monitor vaccination efforts, were proving to be incrementally effective up until the pandemic. The Ministry of Agriculture and Rural Development’s national program for rabies control and elimination for 2011-2015 led to

a drop in human cases from 107 per year on average between 1996-2007 to an average of 95 per year<sup>14</sup>. The next iteration of the program, for 2017-2021, saw human rabies fatalities drop to a yearly average of 12<sup>15</sup> over the previous five-year period.

The government is aiming to eliminate human deaths from dog-transmitted rabies by 2030 through the 2022-2030 program.

#### Average number of human rabies cases in Vietnam



The main constraints facing Vietnam's rabies control efforts include limited access to animal vaccines, a large number of free-roaming, unvaccinated dogs and a lack of awareness of the dangers of the disease and how to behave around dogs among people in remote, mountainous areas, says Le Quang Thong, associate professor at the faculty of Animal Science & Veterinary Medicine at Nong Lam University. The average proportion of dogs and cats that are vaccinated against rabies is approximately 40 per cent. Due to various factors, only 13 provinces out of the 58 nationally have achieved vaccination rates of 70 per cent<sup>16</sup>, the proportion needed to achieve herd immunity.

Karanvir Kukreja, Southeast Asia head of companion animal campaigns for animal welfare group Four Paws says that Vietnam's low vaccination rate is due to the difficulty in vaccinating free-roaming animals and rampant pet theft, which has reduced the incentive for people to vaccinate their pets. Professor Le said that the relatively high cost of vaccination for dog owners in rural areas and the lack of qualified veterinarians in rural areas are contributing factors to Vietnam's low vaccination rate.

**The Vietnam government is serious about meeting the 'Zero by 30' rabies target. To achieve it, the dog and cat meat trade must be banned.**

**Rahul Sehgal,**  
director, international advocacy,  
Soi Dog Foundation

In major urban centers such as Ho Chi Minh City, it is illegal for dogs to be allowed out without a muzzle or a leash. Offenders will be fined VND800,000 (USD35). But the law is not strictly enforced and the penalties

are not considered steep enough to encourage more responsible dog ownership. Nguyen Van Dang, a public administration expert, has called for stricter regulations<sup>17</sup> and tougher progressive fines on dog ownership.

The dog meat trade contributes to rabies transmission in Vietnam, where there are no laws against the trade and consumption of dog meat. An estimated five million dogs and one million cats are killed for their meat in Vietnam every year, making the Southeast Asian country<sup>11</sup> the second biggest consumer of dog and cat meat after China. The trade poses a rabies risk because of the unregulated movement of dogs of unknown disease and vaccination status.

An investigation into the dog meat trade in Vietnam, published in August 2022<sup>18</sup>, found that the trade had been disrupted by the pandemic, because of movement control restrictions that limited trade. However, the trade is now recovering, posing an increasing rabies risk in the country.

In July 2023, Soi Dog Foundation and Vietnam's National Assembly held a workshop to discuss the "ultimate goal"<sup>19</sup> of banning the trade and consumption of dog and cat meat, starting with a ban in Hanoi, the capital, where eating dog and cat meat is rooted in local culture. A ban would be introduced along with anti-rabies measures and a safety zone for vaccinated dogs, officials said.

"The Vietnam government is serious about meeting the 'Zero by 30' rabies target. To achieve it, the dog and cat meat trade must be banned," says Rahul Sehgal, director of international advocacy at Soi Dog Foundation.

However, Catherine Besch, founder and director of Hoi An-based animal rescue and farm sanctuary Vietnam Animal Aid & Rescue suggests that without the population control provided by the dog meat trade, Vietnam would have a far higher rabies rate. "Culling is inevitable if we ban the dog meat trade here because there are no widespread sterilization projects or any veterinary training going on," she says.



# INDONESIA:

## Rabies is spreading to new areas

Rabies is endemic in 26 of Indonesia’s 38 provinces, and the disease has spread across the archipelago in the Covid-19 pandemic era. In 2020, there were 670 reported animal cases, according to data from the animal health services department of the Ministry of Agriculture. In 2022, after Covid-19 movement restrictions eased, there were 1,280 reported cases. As of May 2023, 275 cases have been reported.

Public health officials expect 2023 to be another difficult year for the zoonotic disease in Indonesia, as rabies has been reported in parts of the archipelago where it has not been recorded before, including in East Nusa Tenggara, where there have been 11 deaths reported in the province so far this year<sup>20</sup>.

Dr Nuryani Zainuddin, director of Animal Health at Indonesia’s Ministry of Agriculture, says disruptions to dog vaccination campaigns over the pandemic period have led to the increase in rabies cases. “Over the last three years, vaccination coverage has decreased and has not reached the minimum target of 70 per cent of the at-risk dog population [to achieve herd immunity] in some areas. Also, public awareness of rabies is not yet sufficient, despite ongoing awareness campaigns,” she told Eco-Business.

A rabies control task force rolled out a vaccination campaign in South Central Timor, East Nusa Tenggara in July 2023<sup>21</sup>, inoculating more than 7,000

animals, but experts say 60,000 more rabies vaccines are needed in the area.

Indonesia introduced a One Health Roadmap to control rabies in 2019<sup>22</sup>, aiming to eliminate the disease by 2030, in line with the global target to eliminate dog-mediated human rabies set in 2018.

The government partners with the Indonesian Veterinary Association to sterilize free-roaming dogs and works with local communities to encourage responsible dog ownership and the proper disposal of food waste to manage dog populations.

Some local governments, for instance in Bali, which has one of the world’s highest dog population densities<sup>23</sup>, have implemented culling programs to control rabies. Culling is not effective at controlling rabies<sup>24</sup>, as it curtails the effectiveness of vaccination programs by removing immunized dogs from the population.

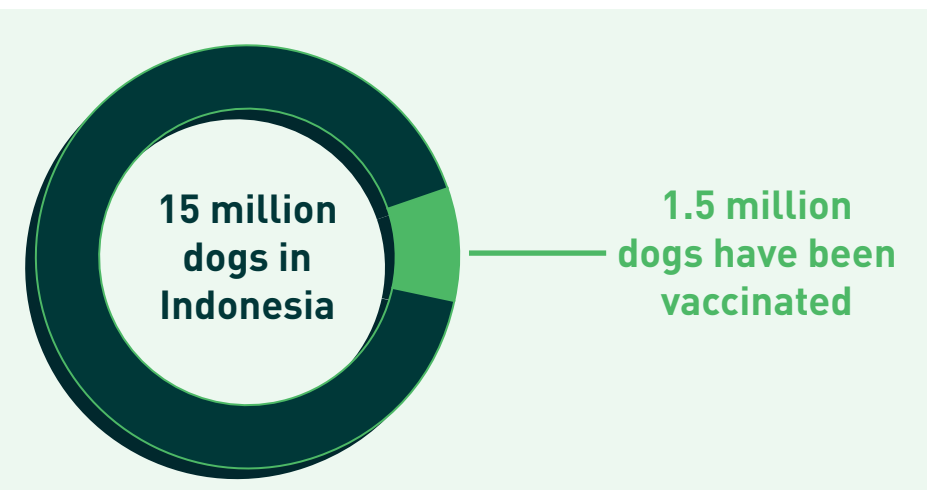
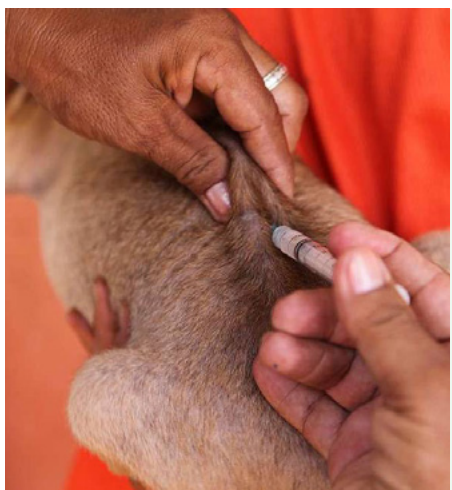
Indonesia’s rabies strategy has been compromised by the cultural tendency among dog owners to let their dogs roam freely, unleashed – which is the biggest challenge facing rabies control in the country, says Dr Nuryani. Limited human and logistical resources to tackle the disease is another issue, as more prevalent diseases in animals, such as foot-and-mouth disease and lumpy skin disease, have taken strategic priority, she says. Reliable

dog population and distribution data is scarce – according to estimates<sup>6</sup>, there are 15 million dogs in Indonesia, of which around 1.5 million have been vaccinated – and the most at-risk areas are hard to access with vaccines that need to be kept cool to remain effective.

Among the most vulnerable parts of the country to rabies outbreaks is West Sumatra, where dogs are used for wild pig hunting. The transportation of dogs from other parts of the country to West Sumatra has heightened the risk of rabies transmission, as has the belief among hunters that vaccination weakens their dogs, which are rarely inoculated as a result, says Wahid Fakhri Husein, who has written a paper on rabies control in Indonesia<sup>22</sup>.

**Some people believe that rabies victims have come under a spell – they don’t consider rabies to be a disease.**

**Wahid Fakhri Husein,**  
infectious disease specialist





Mysticism and the use of traditional medicine to treat bites in remote areas pose additional problems. In parts of Sumatra and East Nusa Tenggara, folk remedies include applying burnt leaves to the wound, applying the biting dog's saliva to the bite wound, or eating the flesh or brain of a suspected rabid animal that has bitten an infected person, says Fakhri. "Some people believe that rabies victims have come under a spell – they don't consider rabies to be a disease," he says.

Others believe that rabies is not a pathogen and was created by the government, a trust issue that could jeopardize government-run vaccination campaigns in rural areas. Covid-19 vaccination programs faced the same issue, says Dr Denny Lukman, a veterinarian and associate professor at IPB University, Bogor, Indonesia.

A key challenge facing rabies control programs in Indonesia is vaccinating free-roaming dog populations. Catching the dogs is usually more expensive than the vaccine itself, says Fakhri. In Bali,

which was rabies-free until an incursion in 2008, free-roaming dogs were caught using nets, and then vaccinated, marked, and released. But subsequent re-vaccination efforts were more difficult. "Dogs are smart animals. When the dog catchers came to vaccinate the dogs the following year, they just ran away," he says.

Oral vaccines, which are offered to dogs in bait, have been trialed as complementary to parenteral (injected) vaccines<sup>25</sup> and were deployed in the field in October 2023 after a lengthy approval process, Fakhri noted. "To eliminate rabies, a good quality vaccine that provides protection for at least a year is needed, until the next vaccination programme is carried out," says Fakhri.

Data accuracy is also an issue for reported cases of rabies. "In rural areas, due to a lack of human resources or for political reasons, some local governments do not provide an accurate picture of rabies," says Fakhri. Better coordination between government agencies is needed to execute

Indonesia's rabies control programs more effectively, says Dr Lukman. "Collaboration between government departments is low, even though the government has issued regulations regarding the control and prevention of zoonoses through the "One Health" approach. Implementation of this approach is still weak in the field," he says.

Rabies cannot be prevented by relying solely on the government, says Dr Lukman, stressing that the private and civic sectors, as well as local communities, are essential to fill resource gaps. Dr Lukman is part of a team that pioneered the rapid rabies response model in Indonesia, where individual villagers are appointed to detect dog bite bases and inform local government officials of rabies cases. Rather than cull biting dogs, as is often the response to bite cases in Indonesia, the animals are isolated and observed for rabies symptoms. The model is to be deployed across the country, including, most recently, East Nusa Tenggara, says Dr Lukman.

## MALAYSIA:

### A once-eliminated disease returns

Malaysia was declared free from rabies by the World Organisation for Animal Health (WOAH) in 2013 with the last record of a human case in 1998. But the country lost that status in 2015 after repeated outbreaks. The latest spike in cases occurred in the province of Sarawak, with nine human rabies cases reported between January and May this year<sup>26</sup>. The cases reportedly originated from neighboring Kalimantan in Indonesia, with rabid dogs traveling north across the border.

Dr Natasha Lee, a veterinarian and founder of animal welfare consultancy Animal Happiness, says that cross-border transmission and weak border security is the main cause of rabies outbreaks in Malaysia – a problem exacerbated by the long, porous border between Malaysia and Indonesia on Borneo, and the border with Thailand, where rabies is also endemic. Some rabid dogs have been known to arrive by fishing boat.

Dr Rafdzah Ahmad Zaki, a public health medicine specialist at the Department of Public Health, University Malaya Medical Centre, says strengthening border surveillance will require cooperation between Malaysia and Indonesia and heightened vigilance from immigration authorities.

Free-roaming dogs are Malaysia's biggest rabies spreaders. Dr Lee highlighted the need to eliminate rabies at source by vaccinating free-roaming dogs. Domestic dogs are often kept as guard dogs and are allowed to roam outside households, contributing to the maintenance of the rabies reservoir.

Public awareness campaigns are needed to promote responsible dog ownership and to encourage dog owners to get their pets vaccinated, said Dr Zaki.

Malaysia's rabies elimination efforts are supported by legislation at the local and national level. Specifically, the Laws of Malaysia Act 647 (Animal Act of 1953) cover special provisions relating to dogs in connection with rabies<sup>27</sup>. These include dog licensing – any dog over five months-old must have a license, according to Malaysian law – management of rabies-infected areas, destruction or detention of an animal suspected to be infected with rabies, detention of any dogs that have bitten a person and rabies vaccinations in dogs.

The Malaysian authorities have responded to the Sarawak outbreak by discretely culling dogs, which Dr Lee said is counterproductive. The indiscriminate culling of dogs in communities where rabies vaccination programs are operating is likely to remove vaccinated dogs from the population, resulting in lower vaccination coverage and an increase in rabies transmission as dog populations recover. Dr Lee makes the case for sterilizing free-roaming dogs, an adjunct strategy for keeping dog populations under control.

Malaysia's Animal Welfare Act 2015 does not prohibit the killing of animals, including dogs and cats, for human consumption. But the trade in cat and dog meat is not a significant contributor to rabies transmission in Malaysia, says Dr Zaki. The public response to Vietnamese nationals selling dog and cat meat in Johor Bahru and Selangor in 2018<sup>28</sup> reveals the level of opposition to the trade in Malaysia. Also, dogs are considered haram<sup>29</sup>, or dirty, in the Muslim-majority country.

Dr Lee is not in favor of mandatory blanket pre-exposure human vaccinations in Malaysia, as she questions the cost-effectiveness of the strategy. Only for people at high risk of transmission, such

as vets, should pre-exposure vaccines be mandatory, according to World Health Organization guidelines<sup>30</sup>. She makes the case for post-exposure vaccines as soon as possible and before the onset of clinical symptoms.

Post-exposure human vaccinations are provided for free or at a low cost by public hospitals. Hence, cost is unlikely to be an issue for bitten patients, said Dr Lee, although transportation costs, distance to the hospital and waiting times could hinder patients from seeking treatment.

It is easier said than done to prevent cross-border transmission given the long, porous border between Malaysia and Indonesia.

Dr Natasha Lee, veterinarian, founder, Animal Happiness

**9** human rabies cases in Malaysia in the first 5 months of 2023







## THE PHILIPPINES:

### Competing diseases are aiding transmission

Only three of the Philippines' 17 provinces have not reported a case of rabies this year, with the worst outbreaks in Central Luzon, a region north of Manila, and Calabarzon, south of the capital. The Philippines Department of Health's Epidemiology Bureau reported an 8 per cent rise<sup>31</sup> in human rabies deaths in the first two months of 2023 compared to the same period in 2022.

The number of cases is likely to be higher, as the data flow from provincial rabies bite treatment centers to the central database was interrupted during the pandemic and has not recovered, says Dr Jerick De Villa, an infectious diseases and tropical medicine specialist at San Lazaro Hospital in Manila. Many cases, he suspects, are going unreported because victims are unaware they have been bitten by a rabid animal or do not know how to identify the symptoms.

The archipelago's strategic plan<sup>32</sup> to control rabies aims to end human deaths from dog-mediated rabies by 2027 and bring about a rabies-free Philippines by 2030, although efforts to eliminate the disease have long struggled with inadequate funding for mass dog vaccinations at the national and local level. During the pandemic, dog vaccination campaigns were curtailed, which has led to an increase in rabies cases in dogs and people. According to official data, human rabies deaths increased by 33 per cent between 2021 and 2022<sup>33</sup>.

But with the number of human deaths still relatively low compared to other diseases – tuberculosis kills 70 Filipinos every day<sup>34</sup> while the Philippines has the fastest growing HIV/AIDS epidemic in Asia – it has likely been hard for the

Department of Health to make the case to prioritize rabies control programs, suggests Dr Karl Henson, an adult infectious diseases consultant at The Medical City hospital in Manila.

Vaccination programs need to be reactivated and intensified to flatten the curve of rabies cases. But efforts to increase vaccination coverage face a range of obstacles. Even though vaccinating pet dogs for rabies is required by law under the Anti Rabies Act<sup>35</sup>, dog owners in the Philippines often let their dogs roam freely, making monitoring at-risk dogs difficult. "For low-middle income households, vaccinating your pet is not a priority. The priority is putting food on the table," says Dr Henson.

There are some 12 million free-roaming dogs and cats spread across a country of more than 7,000 islands. Sharon Bengzon-Yap, education and campaigns officer at the Philippines Animal Welfare Society, advocates for sterilizing free-roaming animals as well as vaccinating them, as free-roaming populations are continuing to grow, making rabies elimination more difficult. "These animals are reproducing faster than they're caught and spayed/neutered. Spay-neutering must be part of the solution [to eliminate rabies]," she says.

The most at-risk areas of the archipelago, such as Central Luzon, are geographically isolated areas that are typically far from a bite treatment center or a hospital, where vaccines are often unavailable. Low awareness of the risks of rabies, how to behave around dogs and what to do if bitten or scratched by a rabid animal often means patients will not seek medical consultation. People who are aware of rabies risk may choose not

to seek medical attention if exposed, because they cannot afford to travel to a hospital, even if the vaccine is free, says Dr De Villa. Ineffective folk medicine, such as garlic, is often used to treat bites rather than postexposure prophylaxis, because treatment is prohibitively expensive for low-income families, he says.

Dr De Villa recommends adding rabies education to school curricula to teach children about the dangers of the disease, and conducting door-to-door awareness campaigns at the local barangay (village) level. "Teaching smaller, targeted groups may be more effective than community-wide campaigns," he suggests.

Awareness campaigns should inform local communities how to behave around animals, when to seek consultation and what sort of bites are potentially hazardous – wild pig and monkey bites also pose a rabies risk in vulnerable areas such as Central Luzon, says Dr De Villa. Compliance to treatment is also critical, he says. Patients must complete the full course of treatment and continually observe the biting animal for signs of rabies.

The dog and cat meat trade also poses a rabies risk in the Philippines. Although a ban on the trade has been in place for 18 years, an underground trade in dog and cat meat is thriving. An estimated 10-30,000 dogs are eaten in the country every year, says Rahul Sehgal of the Soi Dog Foundation. However, tip-off lines and police raids are making dog meat more scarce, and a proposed amendment to the Animal Welfare Act<sup>36</sup> that makes policing the trade the national government's responsibility promises to curb the trade – and so rabies risk – further, says Sehgal.

**For low-middle income households, vaccinating your pet is not a priority. The priority is putting food on the table.**

**Dr Karl Henson,**  
adult infectious diseases consultant, The Medical City, Manila

# THAILAND:

## Regional frontrunner in tackling endemic rabies



### Human rabies cases in Thailand

1980	370
2000	50
2020	2
2023	3

Human rabies cases have steadily reduced in Thailand from 370 reported cases in 1980, to 50 in 2000, to 2 in 2020. However, animal rabies cases have increased slightly over the last decade, and dogs are still the major rabies-affected species and serve as the main reservoir host, maintaining the circulation of rabies virus in the country<sup>37</sup>. The majority of rabies-infected dogs are owned, free-roaming or semi-free roaming, and unvaccinated<sup>38</sup>. Three human rabies deaths have been reported in 2023<sup>39</sup>.

Most dogs in Thailand are community dogs and they are treated as companion animals and allowed to roam freely. A reduction in the number of free-roaming dogs by promoting responsible pet ownership and reducing the reproductive capacity of the owned dog population is cited as a key to rabies control in Thailand<sup>37</sup>. The Department of Livestock Development and Department of Disease Control are the main

government bodies that implement rabies control measures, including vaccination, dog population control, post-exposure treatment in humans and awareness-raising campaigns. The government has developed guidelines for rabies-free areas based on World Health Organization criteria, developed a national rabies control strategy and transferred the rabies control strategy to local administrative organizations.

While rabies cases can be more effectively managed at the local government level, data sharing between government departments can be an issue, says Dr Alicja Izydorczyk, international director of animal welfare at Soi Dog Foundation, an animal welfare charity that catches, neuters, vaccinates and releases about 20,000 animals a month, mostly dogs. “There is little communication or data sharing between different government bodies,” she says. “All stakeholders need to work closer together and share data.”

Thailand is 20 years ahead of its neighbors in tackling rabies, says Dr Izydorczyk, but adds that more needs to be done to control the dog population. There are an estimated 13 million dogs in Thailand<sup>38</sup>, mostly owned, but free-roaming. Around 13 per cent are strays while 5 per cent reside in temples. “The dogs most likely to be transmitting rabies are free-roaming, scared of people and difficult to catch. They’re not sterilized, so their mating behavior makes them travel further [to find a mate]. Unsterilized animals are more prone to disease and may spread rabies through their search for a mate,” says Dr Izydorczyk.

She says government-level communication on rabies has been thorough and effective, and there is rabies education in the school curriculum. “Children are taught the dos and don’ts of how to behave around dogs – to not take food away or tease a dog,” she says. But some of the communication around the disease in the media is too focused on informing people to get a rabies shot if they’re bitten by an animal, which she calls a “band-aid solution”.

“There is not enough focus on the dogs, which are the main source of the problem. If you eliminate rabies in dogs, you will eliminate it in humans. Rather than spend money on post-exposure prophylaxis after someone is bitten, we need to vaccinate and sterilize the dogs first,” she says. Thailand’s Prevention of Animal Cruelty and Provision of Animal Welfare Act criminalized the trade and consumption of dog meat. As such, the dog meat trade is not a major contributor to rabies transmission in Thailand, although Dr Izydorczyk noted that consumption may persist in some remote, border areas of the country.

**If you eliminate rabies in dogs, you will eliminate it in humans.**

**Dr Alicja Izydorczyk,**  
international director of animal welfare, Soi Dog Foundation

# MEXICO:

## Role model in rabies elimination for Southeast Asia

Home to an estimated 26 million free-roaming dogs, on 11 November 2019, Mexico became the first country to receive validation from the World Health Organization<sup>40</sup> for eliminating dog-mediated human rabies as a public health problem.

The South American country's strategy provides Southeast Asian countries with a blueprint for beating the disease by 2030:

- Free, mass vaccination campaigns for dogs that have been running since the 1990s, with more than 80 per cent coverage
- Public awareness campaigns
- Ongoing surveillance
- Timely diagnosis
- The availability of post-exposure prophylaxis in the country's public health services

A "One Health" approach has guided efforts to control rabies in Mexico, and rabies control was made a priority factored into national health budgets. Mexico's health ministry has overall responsibility for canine rabies control and prevention in humans and coordinates all work with other federal agencies, state and municipal governments, non-governmental organizations and academia. As a result of these efforts, the country went from registering 60 cases of human

rabies transmitted by dogs in 1990, to 3 cases in 1999, to zero cases in 2006. The last two cases occurred in two people who were bitten in 2005 and presented symptoms in 2006.

Mexico has introduced pet animal travel restrictions to prevent rabies from spreading across its borders. Every dog or cat moving in or out of the country requires an up-to-date vaccination certificate and rabies antibody checks. Mexico still holds national rabies vaccination weeks and the government maintains a variety of alliances with different actors.

Dr Veronica Cedillo, head of Mexico's National Rabies Control Program, said that<sup>41</sup> the country's success in controlling the disease is the result of political will, sustained program implementation, application of timely, proven strategies and surveillance, and slowly shifting responsibility and leadership for rabies control from national to state level.

Dr Marco Antonio Natal Vigilato, zoonotic diseases and veterinary public health adviser at Pan American Health Organization, said that Mexico is the main example of how close cooperation between countries in the Latin American region, and a regional action plan and governance mechanism (REDIPRA)<sup>42</sup>, can eliminate rabies.





# SOLUTIONS AND RECOMMENDATIONS

Mexico provides a useful model for Southeast Asia to follow in eliminating rabies. The South American country is socio-economically and demographically similar to Southeast Asian countries where rabies is endemic and has a large population of free-roaming dogs. The core strategy deployed in Mexico – mass dog vaccination, ongoing surveillance, animal travel restrictions and regional cooperation – could go a long way towards eliminating rabies as a public health problem in Southeast Asia by 2030.

## Understand local cultural context

But while the same principles for rabies control can be applied across Southeast Asia, an understanding of local context is key, particularly regarding social attitudes towards dogs and trends in dog behavior. Free-roaming dogs harbor the most significant rabies risk, but the sources of rabies do vary by country.

**“Rabies is not only a technical problem, it’s a socio-cultural, organizational and political problem.”**

**Gyanendra Gongal,**  
senior public health official,  
Southeast Asia office,  
World Health Organization

In Indonesia, dogs used for hunting are major carriers as are dogs transported between islands on fishing boats (some fishermen believe that dogs are lucky and can predict the weather).

The dog meat trade is prevalent across most of the region, and programs to control rabies must also consider banning the trade, or instituting stiffer penalties for dog traders and consumers. “Rabies is not only a technical problem, it’s a socio-cultural, organizational and political problem,” says Gyanendra Gongal, senior public health official at the World Health Organization’s Southeast Asia office.

## Vaccinate animals first

A common problem facing rabies control efforts is a misguided focus on vaccinating people before dogs, which are the source of 99 per cent of cases. Human health government departments typically have bigger budgets than animal health ministries, and rabies control programs are naturally skewed towards prioritizing people. For Southeast Asia to achieve better rabies control outcomes, this must change. “The safest way to control rabies is to vaccinate the animals first. They are the main source of infection,” says Dr Tan Do Yew, technical manager, companion animals, and STOP Rabies program lead, regional operating unit ASEAN, Korea, Australia & New Zealand, Boehringer Ingelheim.

## Enforce responsible dog ownership

In most Southeast Asian countries, owned dogs roam freely, unleashed and unmuzzled, posing an ongoing rabies transmission risk if unvaccinated. More must be done to encourage responsible dog ownership, including providing adequate care for animals as well as exercising the duty as an owner to minimize potential risks to people and

other animals. If penalties are in place for irresponsible dog owners, as they are in some Vietnamese cities, they must be enforced.

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technical manager, companion  
animals, and STOP Rabies  
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operating unit ASEAN, Korea,  
Australia & New Zealand,  
Boehringer Ingelheim

## Better manage dog populations

Mass dog vaccination programs should be combined with sterilization efforts to keep free-roaming dog populations at healthy levels. Bhutan is an example of where a capture, neuter, vaccinate and release program delivered effective results. Culling animals is not recommended, not only for animal welfare reasons; it results in lower vaccination coverage and an increase in rabies transmission as populations recover.

## Enhance community knowledge for rapid response

People living in at-risk areas need to be aware of what rabies is, how it is transmitted, how it can be avoided, and what to do when bitten by a rabid dog. Communication needs to be tailored to local audiences, with the key message that rabies is entirely preventable. It should seek not only to raise awareness, but persuade the public to take positive actions to prevent and control rabies in the community. Vulnerable areas should appoint a village leader who is responsible for logging cases, observing infected animals and reporting cases to local officials.

Creative messaging is also key. “Rabies awareness posters typically feature a picture of a fierce, salivating dog. This

stereotype can be misleading,” says Tan of Boehringer Ingelheim. “Before an animal shows symptoms such as aggression or hypersalivation, it is still fully capable of transmitting the disease. Rabies is incubated in animals before they show symptoms. And in the paralytic form of rabies, an animal may be withdrawn and isolated rather than aggressive [behavior characterized by the ‘furious’ form of rabies]. A cute infected puppy looks just as cute as an uninfected puppy, which is why we use images of puppies on our rabies awareness posters,” he says.

## Regional cooperation needed

The Association of Southeast Asian Nations (ASEAN) has devised a series of strategies<sup>43</sup> to eliminate rabies over the past few decades. Targets have

not been met, partly because of a lack of funding and competing economic priorities, says Gongal of the World Health Organization’s Southeast Asia office. More cooperation is needed between countries, including data sharing, animal travel restrictions and cross-border vaccination campaigns, to realize the ‘Zero by 30’ dog-mediated human rabies goal. “Thailand is doing well [at reducing human rabies risk]. But unless Cambodia, Laos and Myanmar control rabies, Thailand will always have a problem. There is a need for an ASEAN-wide mass dog vaccination campaign and ongoing surveillance,” he says.

Bhutan effectively instituted a mass dog vaccination campaign but did not focus enough on surveillance after closing its borders to prevent the spread of the Covid-19 pandemic in 2020, says Gongal. As a result of not knowing where to focus targeted vaccination efforts, the Himalayan kingdom saw an increase in rabies cases<sup>44</sup> from infected dogs crossing the border from India. In September 2020, Bhutan recorded its first human rabies death since 2016, when a 3-year-old girl was bitten by a rabid dog.

### How Kids SHOULD NOT Interact with Dogs

It's common sense. Just imagine how people should interact with each other.

Avoid taking people's food	Avoid bothering dogs when they are eating
Avoid stealing other people's toys	Avoid taking a dog's bones or toys
Avoid putting your face right up to someone else's face	Avoid putting your face right up to a dog's face
Avoid bothering when asleep	Avoid bothering animals when they are resting. Let sleeping dogs lie.
Avoid pestering	Avoid grabbing tail/ears
Avoid climbing on or trampling	Avoid climbing on or trampling
Avoid pinching	Avoid hugging. Most dogs dislike it.
Avoid screaming around	Avoid hollering and shouting. Use your “inside” voice instead.



There is a need for an ASEAN-wide mass dog vaccination campaign and ongoing surveillance.

Gyanendra Gongal,  
senior public health official,  
Southeast Asia office,  
World Health Organization

## CONCLUSION

The pandemic has set back rabies elimination efforts. To get back on track to achieve the 'Zero by 30' goal, targeted vaccination of free-roaming dogs must be prioritized. This will require more funding and logistical support in at-risk areas to inoculate dogs in combination with regional cooperation to improve surveillance. Education is crucial.

Rabies elimination within this decade is not unrealistic but low awareness is a key obstacle. To protect millions at potential risk of rabies exposure in Southeast Asia, more political support, cooperation between corporations, NGOs and local administrations, and media attention will be needed to secure the resources required to eliminate rabies, an entirely preventable disease.







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